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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,212	09/24/2003	Sarah E. Kim	ITL.1039US (P14622)	2146

21906 7590 05/16/2006

TROP PRUNER & HU, PC
8554 KATY FREEWAY
SUITE 100
HOUSTON, TX 77024

EXAMINER	
CHU, CHRIS C	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/669,212	KIM ET AL.	
	Examiner	Art Unit	
	Chris C. Chu	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11 - 25* is/are pending in the application.

4a) Of the above claim(s) *14 - 17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10 - 13 and 18 - 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on February 23, 2006 has been received and entered in the case.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 10 – 13 and 18 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenny, Jr. et al. (U. S. Pat. No. 6,606,251) in view of Goodson et al. (U. S. Pat. No. 6,942,018).

Regarding claim 10, Kenny, Jr. et al. discloses in e.g., Fig. 17A a packaged integrated system comprising:

- an integrated circuit (200; column 9, lines 64 and 65);
- an integrated electroosmotic pump (1230; column 24, lines 29 – 30) mounted on said integrated circuit;
- a re-combiner (the condensation area for fluid that is heated by the device 200 in the element 1410; column 24, lines 48 – 58); and

- a package (2000) including said circuit, said pump, and said re-combiner (see Fig. 17A).

However, Kenny, Jr. et al. does not disclose the re-combiner being a catalytic re-combiner. Goodson et al. teaches in e.g., Fig. 2, Fig. 18 and column 9, lines 16 – 67 a re-combiner (326) being a catalytic re-combiner. It would have been obvious to one of ordinary skill in the at the time when the invention was made to use the catalytic re-combiner of Goodson et al. as the specific style to form the re-combiner of Kenny, Jr. et al. as taught by Goodson et al. to increase the speed of recombination and to provide a closed and hermetically sealed system (column 9, lines 16 – 30).

Regarding claim 11, Kenny, Jr. et al. discloses in e.g., Fig. 17A said integrated circuit (200) being part of a first die (column 9, lines 64 and 65) and said integrated electroosmotic pump (1230; column 24, lines 29 – 30) being part of a second die (1100 and 1230, a part of element 1200 which is a die; see Fig. 8, Fig. 9 and column 11, lines 9 – 15), said second die having a first side and a second side, said pump formed on said first side (see Fig. 17A).

Regarding claim 12, Kenny, Jr. et al. discloses in e.g., Fig. 17A including microchannels (1430; column 23, lines 49 and 50) to circuit cooling fluid on said second side and said second side mounted on said first die (see Fig. 17A).

Regarding claim 13, Kenny, Jr. et al. discloses in e.g., Fig. 17A including stacking said second die (1100, at the top that contains the element 1230) on said first die (200).

Regarding claim 18, Kenny, Jr. et al. discloses in e.g., Fig. 17A said package (2000) being a bumpless build-up layer package (see Fig. 12A and column 18, lines 56 – 59).

Regarding claim 19, Kenny, Jr. et al. discloses in e.g., Fig. 17A a packaged integrated circuit (2000) comprising:

- an integrated circuit (200; column 9, lines 64 and 65);
- an integrated electroosmotic pump (1230; column 24, lines 29 – 30);
- a re-combiner (the condensation area for fluid that is heated by the device 200 under the element 1410, i.e., in the element 1100; column 24, lines 48 – 58); and
- a bumpless build-up layer package (see Fig. 12A and column 18, lines 56 – 59) including said circuit (200), said pump (1230), and said re-combiner, said package (2000) including a build-up layer (400) that mechanically couples said circuit, said pump, and said re-combiner (see e.g., Fig. 17A).

However, Kenny, Jr. et al. does not disclose the re-combiner being a catalytic re-combiner. Goodson et al. teaches in e.g., Fig. 2, Fig. 18 and column 9, lines 16 – 67 a re-combiner (326) being a catalytic re-combiner. It would have been obvious to one of ordinary skill in the at the time when the invention was made to use the catalytic re-combiner of Goodson et al. as the specific style to form the re-combiner of Kenny, Jr. et al. as taught by Goodson et al. to increase the speed of recombination and to provide a closed and hermetically sealed system (column 9, lines 16 – 30).

Regarding claim 20, Kenny, Jr. et al. discloses in e.g., Fig. 17A said integrated electroosmotic pump (1230; column 24, lines 29 – 30) being formed on a first die (1100 and 1230, a part of element 1200 which is a die; see Fig. 8, Fig. 9 and column 11, lines 9 – 15), said integrated circuit (200) being formed on a second die (column 9, lines 64 and 65) and said re-combiner being formed on a third die (1100; see e.g., Fig. 17A).

Regarding claim 21, Kenny, Jr. et al. discloses said integrated circuit die being mounted under said integrated electroosmotic pump die (see Fig. 17A).

Regarding claim 22, Kenny, Jr. et al. discloses in e.g., Fig. 17A said first and second dice being coupled. Furthermore, "copper-to-copper bonding" is product-by-process limitation, even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**: In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**: In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90 (209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 23, Kenny, Jr. et al. discloses in e.g., Fig. 17A including a heat spreader (1410; column 23, lines 34 – 36) coupled to said build-up layer (see Fig. 17A).

Regarding claim 24, Kenny, Jr. et al. discloses in e.g., Fig. 17A said first die including at least one electroosmotic pump on one side and a plurality of microchannels (1440) on the other

side, said microchannels to circulate cooling fluid pumped by said electroosmotic pump (column 23, line 60 – column 24, line 1).

Regarding claim 25, Kenny, Jr. et al. discloses in e.g., Fig. 17A said first die being mounted on said second die with said microchannels facing said second die (see Fig. 17A).

Response to Arguments

4. Applicant's arguments filed on February 23, 2006 have been fully considered but they are not persuasive.

On page 4, applicant argues, "a re-combiner is a device that reduces the buildup of gas in the cooling fluid pump by the pump 28. See present application at page 10, lines 16 – 21. Exposure of gases to the catalytic material 66 in the present application results in gas recombination ... Kenny teaches an element 1410 which is merely a heat exchanger ... the element 1410 is not a re-combiner." This argument is not persuasive. Kenny clearly discloses in e.g., Fig. 17A, 17B and column 24, lines 48 – 58 the element 1410 having a condensation area for fluid in the tube 1260, which is located within the element 1410 (see e.g., Fig. 17B), that is heated by the device 200. Inherently, any condensation area is used to reduce the buildup gas (i.e., H_2O in gas form, O_2, H_2, etc.) by producing a cooled fluid (i.e., H_2O in liquid form). Thus, a reasonable interpretation of the term "re-combiner" includes any condensation area of a cooling structure, such as the structure taught by Kenny. Therefore, Kenny teaches a re-combiner and Goodson et al. teaches in e.g., Fig. 2, Fig. 18 and column 9, lines 16 – 67 a catalytic re-combiner (326).

As a result, the combined structure of Kenny and Goodson et al. discloses all of the claimed limitations, as set forth in claim 10.

For the above reasons, the rejection is maintained.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu
Examiner
Art Unit 2815

c.c.
Wednesday, May 10, 2006